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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/839,365 | 04/23/2001 | Chien-Li Kuo | REF/KUO/882CIP | 2321 |

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EXAMINER

PEREZ RAMOS, VANESSA

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1765

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/839,365

Applicant(s)

KUO ET AL.

Examiner

Vanessa Perez-Ramos

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 24 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,3-11,13-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-11,13-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitations that the semiconductor structures are covered and a plurality of gaps, which are located between neighboring semiconductor structures, are totally filled by said coating layer, and are not filled by the over coating layer, represent new matter not previously described in the Specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1 and 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donley (U.S. 4,299,863) in view of Jillie, Jr. et al. (U.S. 4,808,259).

In regard to claims 1 and 3-11, Donley discloses a method comprising: forming a plurality of semiconductor structures on a wafer (col. 2, lines 64-67); forming a "coating layer" over the surface of the wafer, wherein this "coating layer" "is not less than the heights of said semiconductor structures" (col. 3, lines 25-26, and Figure 3, wherein it is shown that "coating layer" 14 completely covers all of the structures on wafer 10); forming an "over coating layer" over said coating layer (col. 4, lines 41-44); and, forming a contact window in both "over coating" and "coating" layers (col. 4, lines 61-63 and col. 5, lines 64-67), wherein upper part of said contact window is "outwardly widened" (see Figure 13, which shows the contact window being wider in the top than in the bottom, which reads on Applicant's "outwardly widened" or "outwardly crooked"). Furthermore, Donley discloses that the "coating layer" can be made of a dielectric material (col. 3, line 25), and that the "over coating layer" can be made of a dielectric material too (col. 4, line 41). Donley further discloses that "coating layer" (layer 14) completely covers all the structures in the wafer, whereas "over coating layer" (layer 24) does not fill the gaps (See Figures 9-10). Furthermore, Donley discloses that "it is to be understood that many IGFETs would be simultaneously formed in the same silicon wafer to produce one or more integrated circuits in that wafer. However, for convenience, only one such transistor for one such circuit is shown." It is the Examiner's position that, in the case where many structures are simultaneously formed, as disclosed by Donley, gaps would be located between said structures, even if not disclosed, and, furthermore, upon the deposition of the "coating layer", such gaps would be completely filled by said coating layer, as per Applicant's newly added limitations.

Donley does not disclose that the etching rate of the overcoating layer is higher than the etching rate of the coating layer, nor does he disclose preferred angles.

Jillie, Jr. discloses a semiconductor manufacturing method, and further discloses that the variation of process parameters during semiconductor manufacturing is obvious to one skilled in the art (col. 2, lines 30-38 and col. 4, lines 38-44).

It is the Examiner's position that it would have been obvious to one of ordinary skill in the art at the time of the invention to vary etching rates, angles and any other parameters, in view of Jillie's disclosure that this is an obvious step, common during semiconductor manufacturing.

5. Claims 13-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donley (U.S. 4,299,862) in view of Jillie, Jr. et al. (U.S. 4,808,259) as applied to claims 1 and 3-11 above, and further in view of Obeng (U.S. 5,836,805).

In regard to claims 13-17, these claims differ from claims 1 and 3-11 above by including a step of planarizing the dielectric by CMP.

Donley is silent about planarizing its silicon dioxide dielectric layer.

Obeng teaches a semiconductor manufacturing method, and discloses: "the unevenness of dielectrics makes the formation of additional levels of reliable conductors problematic. Consequently, it is desired to planarize or smooth dielectric layers....CMP has become a widely used technique for the planarization of ...dielectric..layers due to the high degree of global planarity that CMP provides" (col. 1, lines 11-31).

It is the Examiner's position that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Donley by planarizing the dielectric layer by CMP, as per Obeng, since Obeng himself provides the motivation to do so: increased reliability of devices, which is highly desirable.

In regard to claims 18 and 20, it is the Examiner's position that etching rates and viscosity are result effective variables, and its variation would have been obvious to one of

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ordinary skill in the art at the time of the invention, with the purpose of establishing the optimum process mode.

Response to Arguments

6. Applicant's arguments filed 10/24/02 have been fully considered but they are not persuasive.

In response to Applicant's argument that Jillie "only discloses value of process parameters... are adjustable", that Jillie does not limit the practical power used to etch, and, furthermore, that the "claimed specific order of etching rate is not disclosed", it is noted that what Applicant claims is that the etching rate of one layer is higher than that for another layer. Jillie is relied upon by the Examiner to show that it is common, obvious and well known in the art to change process parameters, etch rates included, and one skilled in the art would have been motivated to vary the etching rates in Donley, with the anticipation of an expected result.

In response to Applicant's argument that "how to planarize is not the main character of the claimed invention. Thus, the patentability of the claimed invention is independent on Obeng", it is noted that claims 13-17 include a step of planarizing by CMP, and Obeng has been relied upon by the Examiner to show that CMP is common in the art.

In response to applicant's argument that in contrast to his claimed invention, Donley is related to how to prevent damages induced by undesired lateral etching, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

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In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Perez-Ramos whose telephone number is 703-306-5510. The examiner can normally be reached on Mon-Thurs 7:00am-5:30pm.

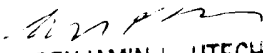
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5665.

Vanessa Perez-Ramos
Examiner
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VPR
January 12, 2003


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